

Sovereign Hill Education

Separation Process: Golden Past

Pre-excursion Activity 1

Wise words

Have a look at the words below. Your teacher will have an article containing these words. Spend 2 minutes trying to work out what is happening in the article. Then discuss it with a partner. Your teacher will then give you the article.



Pre-excursion Activity 2

Thinking it through

Having read the article, you need to use the information to help you design a method for separating gold. You can either design something to get it from Alluvial mining (river beds), Deep Lead mining (underground river beds) or Quartz mining (digging for quartz reefs). If you do more than one thing put it into steps!

Type of mining

Diagram:

Explanation of what to do

Explanation of how it works

Excursion Activity 1

Alluvial Gold: Down on the diggings

Alluvial mining is the easiest to do. It is looking for gold in the creek beds. This type of gold was often called easy gold because a lot of the separation was done for you by weather and erosion.

After you have had a go at panning for gold answer the following question.

- 1 What kind of mixture is gold in for this kind of mining?

- 2 What is the name of the method of separation you are trying to do with a pan and explain how it is meant to help you get gold?

- 3 A Cradle has 2 different methods of separation. What are they and how does it do each one?

Method 1

Method 2

- 4 What were some of the problems you found with this type of mining?

Problem 1

Problem 2

Problem 3

- 5 Can you think of a form of separation that would be better than these?

Explain

Excursion Activity 2

Deep Lead: Red Hill Mine & Horse-powered Machines

After the easy gold was gone, people started digging shafts to find underground riverbeds covered by lava flows thousands of years earlier.

- 1 What kind of mixture is gold in this type of mining?

- 2 How is the gold separated in this type of mining?

- 3 Draw a flow diagram (or labelled pictures if you prefer) of how soil is obtained and carried from the deep lead mines and separated to get gold. Use some of the words in the box to help you. Make sure you know what they are!

Puddling Machine

Whim

Pick

Shovel

Windsail

Windlass

Chilean Mill

Cradle

Flume

Pan

Excursion Activity 3

Quartz (Reef) Mining – Smelting

Quartz mining was the more difficult type of mining, as you were looking for gold in Quartz reefs that ran North-South. Gold is spread out in the reefs so you have to crush a considerable amount of quartz to make money.

- 1 The stages of processing of gold are below. They are all out of order. Number them in order from the mine to 99.9% pure gold. Write the separation process occurring next to relevant stages.

Stages	No.	Process
Left overs are washed over a Wilfley Table, which is shaken, separating tailings from remaining gold-bearing quartz pieces.		
99.9% pure gold		
Gold-bearing quartz is crushed under the Stamper		
Chlorine gas is bubbled through to collect any left-over silver, copper or other metals		
Gold which is still combined is washed over a corduroy blanket and caught here		
Trolleys are taken to the battery		
Impure gold is put into a crucible with flux and heated. The impurities go to the surface and are drawn off		
Amalgam is put into a chamois where the excess mercury is squeezed free		
Gold bearing quartz is blasted or dug out and put in trolleys		
Gold and sand are washed over copper plates coated with mercury where the free gold creates an amalgam with the mercury		
Amalgam is put into a retort and heated, so the mercury evaporates. The evaporated mercury goes through a condenser into water where it solidifies and is collected for reuse		
Blanket sand and Wilfley Table quartz are put into the Iron Berdan Pan. An iron ball crushes the minerals and mercury is poured in to make an amalgam with freed gold.		

Post-excursions Activity 1

Tick the box

In the following table is a list of different types of separation. Put a tick next to them if you saw them anywhere at Sovereign Hill. In the next two columns, write where you heard or saw it and what they were trying to separate. If you saw something more than once, put it in the spare boxes!

Type of separation	✓	Where you saw it.	Things being separated.
Eg. Sifting	✓	Battery trays	Gold from crushed Quartz
Filtering			
Distillation			
Evaporation			
Decanting			
Magnetic			
Chromatography			
Gravitational			
Sifting			

Some of these separation techniques weren't used at Sovereign Hill.

For each of these processes give the name, how it separates, and give an example of where it is used in other industries today. You may need to talk about it with a partner.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

4 Post-excursion Activity 2:

Golden Words

Unscramble each of the clue words. The words are somewhere in your work, so you will have to look back over it. While you are there, check you finished everything!

Once you have worked out the words, copy the letters in the numbered cells to other cells with the same number. Then you will know if you are right.

TINELFIGR

		3							

TYRTABE

				2			

NODLATIITIS

19										6		14		

NEENOSDRC

				15				8	

VIOPEARAOTN

					10					17	

MALGAAM

				18		16	

TEGCAINDN

5									

LACDER

					4		

FITGINS

			12			7	

LNSADWIS

1							

CYDURROO KLTEABN

	13				11			9							

SATPERM

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	

